National Institute of Environmental Health Sciences

Temperature, humidity, and ultraviolet B radiation predict community respiratory syncytial virus activity

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Abstract:

To obtain knowledge of how meteorological conditions affect community epidemics of respiratory syncytial virus (RSV) infection, RSV activity was recorded year-round in 9 cities that differ markedly in geographic location and climate. Local weather conditions were correlated with weekly or monthly RSV cases. Similar reports from other areas varying in climate were also reviewed. Results demonstrated that for all sites combined, weekly RSV activity was related to temperature in a bimodal fashion, with peaks of activity at temperatures more than 24-30 degrees C and at 2-6 degrees C. RSV activity also was greatest at 45-65% relative humidity. RSV activity was inversely related to ultraviolet B (UVB) radiance at 3 sites where this could be analyzed; the fourth site had minimal amounts of annual UVB radiance. At sites with persistently warm temperatures and high humidity, RSV activity was continuous throughout the year, peaking in summer and early autumn. In temperate climates, RSV activity was maximal during winter, correlating with lower temperatures. In areas where temperatures remained cold throughout the year, RSV activity again became nearly continuous. These data led us to conclude that community activity of RSV is substantial when both ambient temperatures and absolute humidity are very high, perhaps reflecting greater stability of RSV in aerosols; transmission of RSV in cooler climates is inversely related to temperature, possibly as a result of increased stability of the virus in secretions in the colder environment; and UVB radiation may inactivate the virus in the environment or influence susceptibility to RSV by altering host resistance.

Source: http://dx.doi.org/10.1097/INF.0b013e318157da59

Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Meteorological Factors, Solar Radiation, Temperature

Geographic Feature:

resource focuses on specific type of geography

None or Unspecified

Geographic Location:

resource focuses on specific location

Global or Unspecified

Health Impact:

specification of health effect or disease related to climate change exposure

Infectious Disease

Infectious Disease: Airborne Disease

Airborne Disease: Respiratory Synctial Virus (RSV)

Resource Type:

format or standard characteristic of resource

Research Article

Timescale:

time period studied

Time Scale Unspecified